

## THE FAUNA AND FLORA OF THE EL SEGUNDO SAND DUNES

### 9. SOME OF THE MITES (ACARINA) OF THE DUNES

By G. F. AUGUSTSON

Of all the biotic relationships existing in the dune area the most intriguing are those between insect and mite pests of plants and their predators. After many months of careful observations the writer has prepared a preliminary report of the activities of some of the mites encountered on the dunes. Two substantial species of predators are here redescribed as well as diagrammed for sake of continuity, in addition to one very well known species. One species new to science is herein described and diagrammed. All diagrams were completed by the writer with the aid of an Abbe Zeiss camera lucida on a compound microscope, measurements of specimens being ascertained with a substage micrometer.

Perhaps the most predominant animal life on the dunes are the mites of the family Tetranychidae. To even the casual observer these mites can be distinguished as a crawling mass over the plants of the meadow area in particular. Among those plants infested appear especially the legumes. However, as is adequately brought out in other papers of this ecological series, many others are as heavily infested. Through the authority of E. A. McGregor who was kind enough to make final determinations of the Tetranychid mites, the following notes are available: *Bryobia practiosa* Koch, host plant a mallow in February (No. 1939-116); *Tetranychina* sp. near *T. mcdonoughi* McG., host plants *Lupinus bicolor microphyllus*, *L. truncatus*, *L. chamissonis*, *Lotus salsuginosus*, and *Astragalus leucopsis*. Although only two species are here mentioned there are undoubtedly many more. Of the two mentioned *Tetranychina* is the most predominant during March and April. It might be mentioned here also that it is *Bryobia practiosa* that causes so much annoyance in homes into which they migrate by the hundreds after heavy rains from nearby clover fields. It is also often claimed that in the homes this species becomes obnoxious to man, but whether it actually attacks man there is as yet no authentic record.

Among the controlling factors for these Tetranychid mites is, first of all, summer heat which retards succulent plant growth. However, they are subject to constant attack by predaceous mites of the families *Erythracidae* and *Bdellidae*. These predators not only attack the adults but also feed liberally upon their eggs. The predators collected and determined by the writer were found to

be *Erythraeus arenicola* (Hall), *Erythraeus tuberculatus* n. sp. (Figs. 2-4) and *Atomus maculatus* Banks (Figs. 5-7), of the family *Erythraeidae*; *Bdella utilis* Banks (Fig. 1) of the family *Bdellidae*. The Erythraeid mites can be observed by concentrating one's attention on bare sandy patches over which they run very rapidly from plant to plant. These fellows are generally bright red in color and with such unequally long legs (see diagrams) that they appear much like small Phalangids. Members of the family *Bdellidae* are much slower in their activities, and are always found during the day under low hanging shrubs.

Invariably anyone who has worked in open fields, preferably grain fields, must have had experience with the final mite reported on in this article, i.e. *Pediculoides ventricosus* Newport (Figs. 8-11). This is the one mite of medical importance so far recorded from the dune area. It attacks humans avidly, bringing about a dermatitis known as the straw-itch. It is known to science to be either predaceous, parasitic, or a scavenger, depending upon the expediencies of its environment. The writer and Dr. W. D. Pierce after much experience with this species are prone to believe that at no time is it a scavenger, basing our assumption on the fact that its presence would be much greater had it such a facility. These mites are very minute, being invisible to the naked eye (except gravid females) (Fig. 9), and are the only mites so far recorded from the dune area exhibiting dimorphism. They are normally parasitic on the larvae of barine weevils (as yet undetermined) of the dune area, and are most abundant from July to January.

The members of the sand dune ecological group who have made notes or collected mites of the species here reported on are Dr. W. Dwight Pierce, Mrs. Dorothy Pool, George P. Kanakoff, J. C. von Bloeker, Jr., E. S. Cobb, Lloyd M. Martin, Dr. Robt. L. Rutherford, Miss Frances L. Cramer, Frank B. Cramer, Charles A. Fleschner, Mrs. Clara L. Pierce, and the author.

#### ERYTHRAEUS TUBERCULATUS n. sp. (Figs. 2, 3, 4)

FEMALE (Fig. 2):

GENERAL ANALYSIS: Body length 1 mm., width 0.7 mm., a large mite, bright red in color, entire body and appendages covered with plumose hairs.

DESCRIPTION: Dorsum: No line of demarcation between cephalothorax and abdomen; dorsal groove present, anterior and posterior ends enlarged, each with two long slender setae; general shape broadly oval, anterior border blunt; entire dorsum thickly beset with many feathery hairs; two pairs of eyes present, small, inconspicuous, pale, and on very short peduncles; pedipalps and

chelicerae visible from above. Venter: same as dorsum, no visible sclerites; coxae arranged radially in pairs; genital aperture arranged in an elliptical groove closely guarded by strong setae; anal groove separate from genital groove, situated on the ventral posterior border. Capitulum: chelicerae needle-like, finely serrate at the tip; tracheal tube openings at the base of the basi-capitulum; hypostome unarmed, triangular, conforming to shape of basi-capitulum; four pairs of long plumose setae on lateral edges of basi-capitulum; pedipalps large, long, basal segment small, not one-third length of the second, second the largest, broadly rounded dorsally, flat ventrally, third segment uniform width, two-thirds as long as second, flattened ventrally, fourth segment shorter than third, terminating in a single strong claw, fifth arising near the base of fourth, club-shape opposing the fourth thumb-like, entire pedipalps thickly beset with many plumose setae, segment three with eighteen prominent dorsal tubercles, fourth with twelve (Fig. 3). Legs: very long, thin, thickly beset with many plumose setae; first pair twice the length of the body, two middle pairs one and one-fourth, fourth pair one and three-fourths length, tarsi not swollen, uniform width, bluntly terminated anteriorly, no pulvilli, two strong clavate claws. (Fig. 4.)

Type locality: Sand Dunes, El Segundo, California.

Predator on other mites and small insects.

Discussion: Although there is a remarkable resemblance of this species to *E. arenicola* in the color and type of plumose setae, the very prominent tubercles on the pedipalpi definitely exhibit the character of a new species.

The holotype female and allotype male on a permanent slide as well as many paratype slides are deposited in the collection of the Los Angeles Museum of History, Science and Art, while paratype slides are available for distribution to other museums.

ATOMUS MACULATUS (Banks 1904), Banks 1915. (Figs. 5, 6, 7)

REDESCRIPTION OF FEMALE (Fig. 5)

Synonymy: *Rhyncholophus maculatus* Banks, 1904, pg. 28-30  
*Atomus maculatus* Banks, 1915, pg. 40-41

GENERAL ANALYSIS: Body length 0.7 mm., width 0.5 mm., a small mite, dull yellow in color, entire body and appendages with scattered long setae.

DESCRIPTION: Dorsum: Broadly oval, no line of demarcation between cephalothorax and abdomen; dorsal groove present, indistinct, anterior and posterior ends enlarged each with two

very long slender setae; two pairs of eyes present, small, pale, flat and inconspicuous. Venter: same as dorsum, no visible sclerites; coxae arranged radially in pairs; genital aperture immediately posterior to fourth coxal segments, groove guarded by long slender setae; no suckers present; anal aperture ventral just within posterior border. Capitulum: chelicerae needle-like, smooth at the tip; tracheal tube openings at the base of the basi-capitulum; hypostome unarmed, triangular; pedipalps long, slender, first segment small, not one-third length of second, third segment one and one-half length of second, fourth segment small ending in a single strong claw, fifth segment attached to base of fourth in opposition to the fourth thumb-like. Legs: moderate length, equal; tarsus of leg one greatly swollen, others normal; no pulvilli, tarsi ending in two strong clavate claws.

Predator on other mites and small insects..

Discussion: This species presents a very unusual life cycle which was first recorded by Banks (1904). Quiescent stages follow stages of active growth. The earliest stage of quiescence was recognized by Banks (1904) as the nympho-chrysalis (Fig. 6), between larva and nymph and the later stage as the teleiochrysalis (Fig. 7), between nymph and adult. In both of these stages the mite is devoid of appendages.

#### PEDICULOIDES VENTRICOSUS Newport (Figs. 8-11)

##### REDESCRIPTION OF FEMALE (Fig. 8)

GENERAL ANALYSIS: Body length 0.2 mm., width 0.05 mm., very small mites; colorless, setae strong on legs, weak on body.

DESCRIPTION: Dorsum: capitulum visible from above, large, head-like; cephalothorax and abdomen divided by a pseudo-groove of demarcation, the cephalothorax one-third the length of the abdomen; cephalothorax with specific chaetotaxy, one mid-lateral pair of clavate setae (the so-called pseudostigmatic organs) with one pair of strong spinose setae immediately posterior; abdomen with three strong spinose setae at extreme posterior border, one in mid-line, two lateral; a flat velum projecting laterally from pseudo-line of demarcation on each side. Venter: devoid of setae; coxae arranged radially in pairs; spiracles opening ventrally at base of capitulum at union with cephalothorax; genital and anal apertures indistinct, both sub-terminal posteriorly. Capitulum: Distinctly headlike, a distinct pseudo-articulation with cephalothorax; two papillae laterally at the base, the rudimentary pedipalpi not visibly segmented; chelicerae needlelike, retractile, minute; hypostome unarmed, flat, conforming to shape of basi-capitulum. Legs: strong, of uniform length, all with many strong, slender setae; tarsi of legs one-three (Fig. 10), each with a single, long slender seta, tarsus of leg four with a very

long, slender seta in addition, three times the length of the tarsus; all tarsi gradually attenuated and ending in a caruncle, at the base of each a small double clavate claw. In the gravid female the posterior portion of the body becomes greatly distended. (Fig. 9.)

#### REDESCRIPTION OF MALE (Fig. 11)

GENERAL ANALYSIS: Body length 0.18 mm., width 0.05 mm., colorless, pseudostigmatic organs absent, very prominent strong setae dorsally.

DESCRIPTION: Dorsum: capitulum pseudo-articulation with cephalo-thorax as in female; pseudostigmatic organs absent; pseudo-groove of division between cephalothorax and abdomen in posterior one-third of dorsum, greatest width of dorsum at this point; one pair of long slender setae lateral to mid-line just above coxae of leg one, a much shorter pair midway to pseudo-groove of cephalothorax just lateral to mid-line, a very strong, long pair of setae in a similar position just above the same groove; abdomen narrowed posteriorly, two very short spinose setae at postero-lateral angles, two much longer setae immediately anterior just lateral to mid-line; distal portion of coxae of legs three and four visible from above. Venter: same as in female. Capitulum: as in female. Legs: uniform length as in female; chaetotaxy as in female with added pair of strong slender setae on legs two-four; tarsus four with extremely long setae; caruncles and claws of legs one-three as in female; tarsus four ending in a single strong seta.

Type Host: Larvae of barine weevils.

(Note: This mite was brought into the Museum laboratory on several occasions, and in spite of great care to isolate, it multiplied rapidly and succeeded in attacking every breeding jar in the room and many of the mites attacked me. Fumigation with cyanide was necessary to destroy the infestation.—W. D. Pierce.)

PLATE 51

- Fig. 1. *Bdella utilis* Banks. ♀. Whole mount, dorsal aspect.  
Fig. 2. *Erythraeus tuberculatus* Augustson. Holotype ♀. Whole mount, dorsal aspect.  
Fig. 3. *Erythraeus tuberculatus*. Pedipalpi of holotype ♀.  
Fig. 4. *Erythraeus tuberculatus*. First tarsus of holotype ♀.  
Fig. 5. *Atomus maculatus* Banks. ♀. Whole mount, dorsal aspect.  
Fig. 6. *Atomus maculatus*. Nympho-chrysalis.  
Fig. 7. *Atomus maculatus*. Teleio-chrysalis.  
Fig. 8. *Pediculoides ventricosus* Newport. Non-gravid ♀. Whole mount, dorsal aspect.  
Fig. 9. *Pediculoides ventricosus*. Gravid ♀. Whole mount, dorsal aspect.  
Fig. 10. *Pediculoides ventricosus*. ♀ Tarsus No. 1, claw caruncle.  
Fig. 11. *Pediculoides ventricosus*. ♂. Whole mount, dorsal aspect.



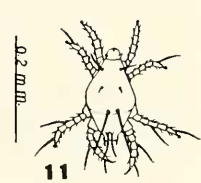
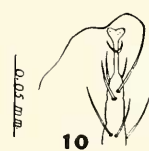
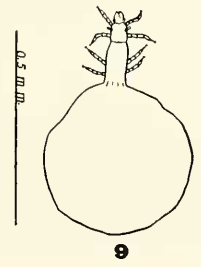
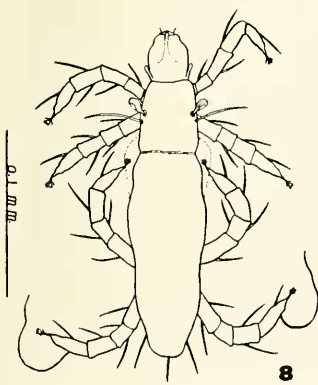
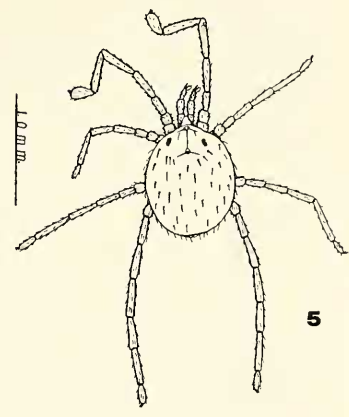
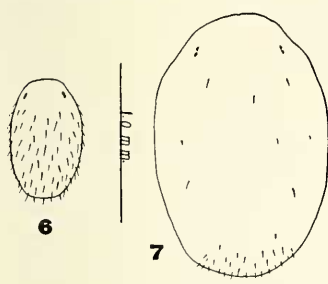
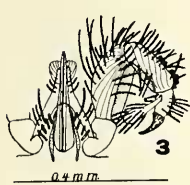
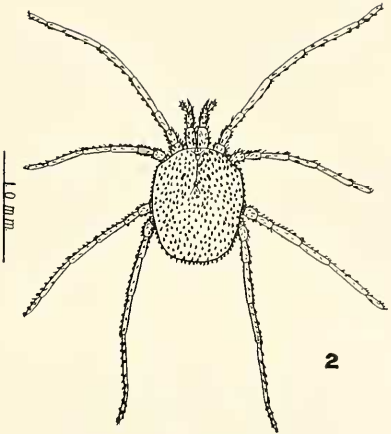
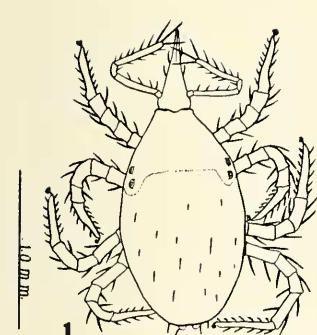


PLATE 51